THE REMARKS

Claims 1-84 were pending prior to entering the amendments.

The Amendments

Independent claims 1, 24, 53, 59, 65, 81, and 83 have been amended. Dependent claims 19, 21, 44, 46 and 51 have been amended. Claims 22-23 and 47-48 have been cancelled. New claims include 85-88. Support for these claims is as follows:

Claims 1, 24, 81, 83 – General Discussion: page 10-23, Fig. 7-10, Specific Citations: pg. 12, lines 3-4, pg 14, lines 19-22, pg 14, lines 7-10, pg. 14, lines 24-26, pg. 15, lines 11-14, pg. 16, lines 7-9, Pg. 18, lines 17-22, pg. 19, lines 24-28, Pg. 20, lines 3-7, pg.20, lines 10-12, pg.20, lines 2—22, and pg. 23, lines 6-8.

Claim 19 and 44 – pg.16, lines 25-26.

Claim 21 and 46 – pg. 18, lines 12-16.

Claim 51 is amended to change an antecedent due to the amendment of independent claim 1.

Claim 53 and 59 – pg. 25, lines 12-13.

Claim 65 and 73 - pg. 25, lines 20-22, pg.25, line 30 and pg. 26, lines 1-2.

Claim 85 and 86 – Fig. 2-4. pg. 16, lines 22-26

Claims 87 - Fig. 23-24, pg. 27, lines 10-29 and pg. 28, lines 1-28, and pg. 29, lines 1-3.

Claim 88 - pg. 12, lines 1-4.

No new matter is introduced in any of the above amendments. The Examiner is requested to enter the amendment and re-consider the application.

35 U.S.C. Rejection

Claims 1-19, 21-44, 46-50, 81, and 83

Claims 1-19, 21-44, 46-50, 81, and 83 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Shankar, et al. (U.S. 2004/0066781, "Shankar") in view of Ryals, et al.

(U.S. 6788671, "Ryals"). In response, the Applicant has amended claims 1, 24, 81 and 83 and respectfully submits that the subject claims are now patentable.

Independent Claim 1

Independent claim 1 has been amended to describe the action and results from the derivations, deletions and re-creations of the packet header in a system with backplanes. This limitation is"

> "wherein the first logic derives at least a portion of the control information from a packet header, and deletes the packet header prior to communication of the packet over the one or more backplane connections, and wherein a third logic re-creates at least a portion of the packet header from the control information after communication of the packet over the one or more backplane connections, wherein the derivations, deletions and re-creations of the packet header mitigate bandwidth limitations caused by the backplane connections and improve system throughput."

This amendment in claim 1 incorporates the inventive concept that the packet is modified in the Applicant's system in order to maximize the throughput performance and the use of bandwidth of the system. In the Specification, the Applicant notes,

> "It is often necessary to communicate packet control information between two or more entities interconnected by a backplane connection for various tasks or functions such as packet classification, quality of service assignation, packet deletion, packet mirroring, or the like, which tasks or functions may be distributed between the two or more entities. Such communications pose significant challenges given that backplane connections are often subject to tight bandwidth constraints or limitations." (emphasis added) (page 1, line 21-26)

The fact that backplane connections present "bandwidth constraints or limitations" is well known in the industry. For example, one of the cited references, Ryals, deals with the issue that backplane connections are not transparent. Ryals offers one possible solution, as will be discussed in subsequent paragraphs.

To address the issue of backplane constraints, the Applicant describes a system that intelligently manages the content and size of packet header in order to maximize the performance in the system. The management of the packet includes the process of deriving, deleting and re-creating the packet header. An example of this packet management is:

> "The AFH header, identified with numeral 1402, is shown in phantom since relevant information from this field is encoded into the packet, and then this field is deleted

> before transmission of the packet over the backplane connection." (Emphasis Added) (pg 14, lines 19-22)

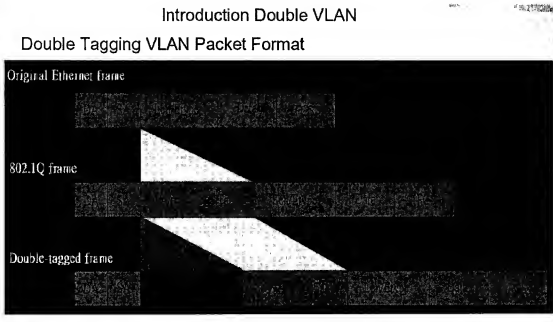
Other similar examples are at pg 14, lines 7-10, pg. 14, lines 24-26, pg. 15, lines 11-14, pg. 16, lines 7-9, Pg. 18, lines 17-22, pg. 19, lines 24-28, Pg. 20, lines 3-7, pg.20, lines 10-12, pg.20, lines 2-22, and pg. 23, lines 6-8. As a further example, Fig. 7-10 illustrates packets that have been modified at different points in the system in order to manage the content and size of the packet header in order to optimize the performance considering the limitations introduced by the one or more backplanes. This motivation and the techniques described by the Applicant are not included in the referenced prior art of Shankar or Ryals.

Relative to Shankar. Shankar describes a method to "deliver Ethernet or other service to multiple customers geographically dispersed across a network," (Para. [0029]). In other words, Shankar is solving a problem in a wide area environment, whereas the Applicant is solving a problem within an embedded electronic system. Shankar is not concerned about the impact of a backplane, but rather the issues of looking for a "fast and efficient way using the Internet to interconnect a group of private site-offices belonging to the private corporate entity together." (Para. [0004]). In order to solve this problem, Shankar disclosed a solution based upon a "double tagging engine". The double tagging engine technology is based on the IEEE Standard 802.1Q, and is also referred to as "S-VLAN".. To facilitate this technology, additional frames are added to the packet in order to achieve efficient communications in the wide area network by providing a capability to significantly increase the number of VLAN addresses. A summary of this double tagging is provided by juniper.net:

> "As specified in IEEE Standard 802.1q, the twelve-bit VLAN identifier's tagged frames enables the construction of a maximum of 4,096 distinct VLANs in an Ethernet B-RAS application environment; however, this VLAN limit is inadequate. A stacked VLAN (S-VLAN) provides a two-level VLAN tag structure, which extends the VLAN ID space to over 16 million VLANs.
>
> Creating an S-VLAN requires the use of a second encapsulation tag. The ERX system performs decapsulation twice, once to get the S-VLAN tag and once to get the VLAN tag. Using this "double tagging" approach allows for over 16 million address possibilities, which more than satisfies the scaling requirement for Ethernet B-RAS applications." (Emphasis added)

(http://www.juniper.net/techpubs/software/erx/erx50x/erx-product-overview/html/physical-link-overview15.html)

A graphic example of double tagging is provided by D-Link



(ftp://ftp.dlink.pl/des/des-3828/documentation/DES-3800_howto_en_Double-VLAN_20060623.pdf, Page 4)

As is clearly noted in the graphic example and the juniper.net reference, double tagging adds frames in order to achieved expanded address capacity in the wide area network. When the packet is received by a user, portions of the header are removed as part of the decoding process. Appropriately, Shankar describes the process of removing VLAN tags at an uplink port in a wide area network (FIG. 9, para.[0071-0074]). The removal of the VLAN tags is necessary to decode the additional addresses related to the SP VLAN wide area network. Clearly, the addition of frames to the packet header by Shankar is not motivated by a desire to improve the speed of operation with in a system, as described by the Applicant. In fact, the addition of double tagging frames is in conflict with the Applicant's objective to minimize the size of the packet header in the Applicant's system, including backplanes.

Relative to Ryals, Ryals describes a system to improve the performance (speed) in an environment with backplanes within in a system. As described by Ryals,

> "One significant disadvantage of routing cells [i.e. packets] through switching device 100 in the manner described above is that the messages that are sent between the switch controller 122 and the various interface cards to determine the appropriate routing paths are sent over backplane 108. Consequently, less bandwidth is available for transmitting the actual cells between the interface cards." (Emphasis Added) (Col. 2, Line 42-48)

Ryals method of achieving an improvement in performance is to create a queue,

> "Each interface card is configured to support the maximum transfer rate of the backplane by maintaining a "pending" queue to track data that has been received but for which the appropriate destination has not yet been determined." (Emphasis Added) (col. 5, lines 15-19)

Whereas Ryals' method offers a method to improve the performance in a system, it does not consider the impact a the packet header in the system.. In fact, Ryals is silent on the existence of a packet header in his disclosure. Moreover, Ryals does not disclose the management or characteristics of the packet, including its size or content. Ryals accepts the packet's characteristics and processes those packets through his queue.

Hence, if one would combine the teaching of Shankar in view of Ryals, one would obtain a system that would decrease in performance because Shankar teaches increasing the packet header size during the entire communication process, which would cause a reduction in the performance in Ryals' system due to the larger size of the packets. Hence, one skilled in the art would not combine the teaching of Shankar and Ryals.

Additionally, claim 1 is amended as follows:

> "wherein the proprietary control information as stored in the packet either replaces or appears in the packet to ~~one or more other network entities~~any third party devices that may happen to gain access as at least a portion of one or more standard packet fields;"

This amendment is supported by the Applicant's Specification pg. 12, lines 3-4. The amendment acknowledges that the system is not transparent to third parties. Neither Shankar nor Ryals disclose this concept, considered singly or in combination.

Accordingly, the Applicant respectfully asserts that amended claims 1 is an allowable claim.

Independent Claims 24, 81 and 83

Claim 24 is a method claims with the same elements as amended claim 1. Therefore, the aforementioned arguments for amended claim 1 also apply to amended claim 24. Accordingly, the Applicant respectfully asserts that amended claim 24 is an allowable claim.

Claim 81 and 83 are a system and method claim wherein the amendment of claim 1 has been incorporated within these claims. Therefore, the aforementioned arguments for amended claim 1 also apply to amended claims 81 and 83. Accordingly, the Applicant respectfully asserts that amended claims 81 and 83 are allowable claims.

Dependent Claims 2-19, 21, 25-44, 46-50,

Claims 2-19, 21, 25-44, 46-50 are directly or indirectly dependent on amended claims 1or 24. The Applicant respectfully asserts that claims 2-19, 21, 25-44, 46-50 are allowable at least based on an allowable base claim.

Additionally, dependent claims 19 and 44 have been amended to incorporate the element, "and priority for the queue is selected based upon the quality of service information of the packet." The amendment is supported by the Applicant Specification, pg. 16, lines 25-26. Neither Shankar nor Ryals discuss quality of service. The reference Lou discloses the concept of quality of service, but not as a method to establish a priority for the queue. Moreover, Lou is silent on the concept of a queue. Accordingly, the Applicant respectfully asserts that amended claims 19 and 44 are allowable claims

Additionally, dependent claims 21 and 46 have been amended. Referring to amended claim 21,

> "The system of claim [[3]] 1 wherein by dropping a portion of the packet, the control information is added to the packet and the packet is communicated in-band over the one or more backplane connections without requiring additional clock cycles."

The amendment is supported by the Applicant's Specification pg. 18, lines 12-16. Shankar cites some communication systems which utilize in-band communications for control information (Shankar para.[0002]), but does not disclose systems or methods that manage the characteristics of the packet in order to achieve in-band communications. Further, there is no disclosure of the application and utility of this method for communications in backplane environments. Accordingly, the Applicant respectfully asserts that amended claims 21 and 46 are allowable claims

Dependent Claims 20 and 45

Claims 20 and 45 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Shankar in view of Ryals and further in view of Kalkunte, et al. (U.S. 2002/0012345, "Kalkunte"). Claims 20 and 45 are directly dependent on amended claims 1or 24. The Applicant respectfully asserts that claims 20 and 45 are allowable at least based on an allowable base claim.

Dependent Claims 51 and 52

Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Shankar in view of Ryals and further in view of Williams (U.S. 7031325, "Williams"). Claims 51 and 52 are directly dependent on amended claims 1or 24. The Applicant respectfully asserts that claims 51 and 52 are allowable at least based on an allowable base claim.

Claim 51 is amended to change the antecedent for "third logic", due to the amendment of claim 1.

Claims 53-64

Claims 53-64 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Shankar in view of Ryals and further in view of Bare (U.S. 2003/0142685, "Bare").

Independent Claims 53 and 59

Independent claims 53 and 59 have been amended to incorporate the element,

> "wherein quality of service information is used to identify a queue into which the packet is stored before transmission over the one or more backplanes and priority for the queue is selected based upon the quality of service information of the packet."

This amendment is supported by the Applicant's Specification pg.16, lines 25-26 and pg.25, lines 12-13. Neither Shankar nor Ryals or Bare discuss quality of service. The reference Lou discloses the concept of quality of service, but not as a method to establish a priority for the queue. Moreover, Lou is silent on the concept of a queue. Only Ryals discloses systems with backplanes and the concept of limited bandwidth related to backplanes (col.2, lines 42-48); but Ryals does not teach quality of service a method to manage those limitations. Accordingly, the Applicant respectfully asserts that amended claims 53 and 59 are allowable claims

Dependent Claims 54-58 and 60-64

Dependent claims 54-58 and 60-64 are directly or indirectly dependent on amended claims 53 or 59. The Applicant respectfully asserts that claims 54-58 and 60-64 are allowable at least based on an allowable base claim.

Claims 65-80, 82, and 84

Claims 65-80, 82, and 84 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Shankar in view of Ryals and further in view of Lou, et al. (U.S. 7173935, "Lou").

Independent Claims 65 and 73

Independent claim 65 has been amended as follows:

> "A system for extending the number of ports of a switch in a network comprising:

a first switch coupled to a second switch and the first switch having a greater number n of ports than the number of ports m of the second switch;

first logic for storing in a layer of the packet above the physical layer an identifier of a port of the first switch;

second logic for communicating the packet between the first and second switches,

wherein the second switch appears to the network to have n ports rather than m ports."

In the office action dated 7/22/2008, the Examiner cited Lou (col. 30, lines 20-25) to reject the elements of claim 65 presented in the Applicant's office action response, dated 4/29/2008. The Applicant has amended claim 65 to clarify that "a first switch coupled to a second switch and the first switch having a greater number n of ports than the number of ports m of the second switch;" and that "the second switch appears to the network to have n ports rather than m ports." The amendment is supported by the Applicant's Specification pg. 25, lines 20-22, pg.25, line 30 and pg. 26, lines 1-2.

Respectfully, the Applicant notes that the cited reference does not describe two switches. The reference describes a port interface 2512 that supports eight ports in one embodiment and in other embodiments the port interface 2512 can have a greater or lesser number of ports. However, even if one hypothesizes the existence of another switch, there is no discussion or motivation to discuss the relationship of the number of the ports of the two switches. Relative to the Applicant's claim, the number of ports in the port interface 2512 is only relevant in relation to another switch; and as noted that switch was not described in the cited reference. Accordingly, the Applicant respectfully asserts that an amended claim 65 is an allowable claim.

Claim 73 is a method claims with the same elements as amended claim 65. Therefore, the aforementioned arguments for amended claim 65 also apply to amended claim 73. Accordingly, the Applicant respectfully asserts that amended claim 73 is an allowable claim.

Dependent Claims 66-72 and 74-80

Dependent claims 66-72 and 74-80 are directly or indirectly dependent on amended claims 65 or 73. The Applicant respectfully asserts that claims 66-72 and 74-80 are allowable at least based on an allowable base claim.

Dependent Claims 82 and 84

Dependent claims 82 and 84 are directly or indirectly dependent on amended claims 81 or 83. The Applicant respectfully asserts that claims 82 and 84 are allowable at least based on an allowable base claim.

New Claims

Claims 85 and 86

New claim 85 is a dependent claim, dependent on claim 1, which describes the Applicant's system comprising I/O blades and management/switching blades. Key components in these blades are further described. A new claim 86 is a dependent claim, depending on claim 85, that further describes a packet queue and that the quality of service information determines the selection in the Applicant's system.

These claims are supported by the Applicant's Specification Fig. 2-4, and pg. 16, lines 22-26. None of the cited references describe a system as claimed, considered singly or in combination. Accordingly, the Applicant respectfully asserts that new claims 85 and 86 are allowable claims.

Claim 87

New claim 87 is a dependent claim, dependent on claim 73, which describes a system comprising a first switch (third party switch) and the second switch (proprietary switch). The first switch has n ports and the second switch has m ports, where n is great than m. The packet processing within these switches is described, and that packet processing allows the second switch to appear to the network to have the same number of ports as the first switch, i.e. n ports.

This new claim is supported by the Applicant's Specification Fig. 23-24, pg. 27, lines 10-29 and pg. 28, lines 1-28, and pg. 29, lines 1-3. None of the cited references describe this

application and the packet processing as claimed, considered singly or in combination. Accordingly, the Applicant respectfully asserts that new claim 87 is an allowable claim.

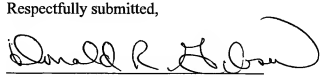
Claim 88

New claim 88 is a dependent claim, dependent on claim 1. This claim describes a system feature that masks the control information such that the control information appears as a standard packet field to a third party. Hence, the system has protection from the threat of breach by the third party. None of the cited references describe this feature, considered singly or in combination. Accordingly, the Applicant respectfully asserts that new claim 88 is an allowable claim.

CONCLUSION

Applicants believe that the application is now in good and proper condition for allowance. Early notification of allowance is earnestly solicited.

Respectfully submitted,



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